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Vol. XIX MAY, 1928 No. 5

The Social Worker and Family Health*

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IT is our intention particularly to discuss the opportunities of the general family social worker for the specific and individual limitation of disease and promotion of health in her family contacts. Yet, as a background, a glance at the sickness problem in general may enable us more readily to appreciate, if not accurately to estimate, the burden which disease places on families, indigent and otherwise, and in turn upon the agencies concerned with the re-habilitation of the economically handicapped.

Sickness, while no doubt for certain causes decreasing with the declining death-rate, is still a tremendous factor in modern life. It is estimated that in the United States and Canada, over six million patients were treated in hospitals last year. Institutions for mental diseases cared for seven hundred and fifty thousand more. Over twenty-two million paid visits to clinics and dispensaries. Over forty million employed individuals lost an average of over eight days as a result of sickness.

Health examinations of various groups of people indicate that the great majority are in need of medical or dental advice or treatment for minor or serious disease or defect. From seventy to ninety per cent. of the school children are said by various authorities to be afflicted with preventable disease or correctable defect. It is estimated that one per cent. of our population is actively tuberculous. Sickness surveys show that at least two per cent. are incapacitated by illness at any one time. Incidentally, here in Montreal, in the sickness survey carried out in a French section of the City in 1926, during the month of December, over two and a half per cent. were recorded as ill, a condition which may to some extent reflect seasonal conditions.

Obviously, this tremendous burden of illness is reflected in the work of the family welfare societies. Mr. Bailey B. Burritt, of the New York Association for Improving the Condition of the Poor, recently reported that a study of 3875 families disclosed 5613 separate health problems as compared with 3643 other types of social problems. A study of 500 families by the

*Read before the annual meeting of the Canadian Natl. Conf. of Social Work, Montreal, April, 1928.

Boston Family Welfare Society in 1926 indicated that in over 50% of this group, the bread-winners were ill at some time during the year. Among the 2448 individuals concerned, 1295 received medical care.

Of course, the cost of all of this illness is tremendous. It is estimated that for physicians, hospitals, clinics, maternity services, and medicines, patent and otherwise, the average per capita expenditure is from $50 to $150. Of course this wide range indicates that we actually know very little about the cost of illness, and should know a great deal more.

An important problem for social and other agencies is how best to meet this need; how to care for these individuals; how to finance these services. It is a bigger and much more important problem to learn how to prevent much of this burden upon society. In this problem the social worker is as interested as the health worker—not only the medical social worker, the psychiatric social worker, and others specializing in medical social work, but also all others concerned with family welfare. And a large portion of this perpetual wave of illness and incapacity is preventable. In the Framingham Health and Tuberculosis Demonstration, where a large part of the population was carefully examined, it was found that 77% were suffering from minor or serious illness or defect. Of the total number thus classified it was estimated that 64% were suffering from conditions directly preventable; 22% from conditions partially preventable; and only 14% from conditions presumably unpreventable. It is also clearly recognized that this prevention depends not upon new discoveries, but upon the application of known means and resources. It is, of course, partly a community problem, but largely one of individual responsibility and one of personal hygiene in its broadest sense.

We do not intend here to discuss the relation to this problem of general community organization. This is, indeed, fundamentally important but not directly pertinent to the family social worker. We shall be immediately concerned, not with what municipalities and appropriating bodies should do, or with the work of the Health Department, the Medical Officer of Health, or the medical authorities, but with the opportunities of those in immediate contact with people in homes. Finally, we wish to touch not especially on the side of medical care, or relief and institutional facilities, or the medical service routine, except as these have a prophylactic significance. We do want to comment particularly upon the reduction and prevention of disease and the promotion of health, and will be primarily concerned with both the negative and positive aspects of the establishment and maintenance of individual and family health.

In the promotion of this health programme, the family social worker has opportunities and obligations—responsibilities in other words—that are exceeded by those of no group in this Dominion to-day. She has a wide contact with thousands of families. She has access into the home and sees a great variety of hygienic and morbid conditions. She visits at times of need,

when the members of the family are, in many instances, more likely to be receptive to suggestions and persuasion. She has a marvelous opportunity to serve as a messenger and teacher of health.

Given this opportunity, and the will and desire to use it for hygienic ends, what are the chief objectives to be recognized? This is, of course, in a sense equivalent to asking what are the objectives of the programme for disease prevention and health promotion, for the limitation, so far as may be of this tremendous volume of illness, and for the enhancement of health generally.

Let us recall that it is convenient, under many circumstances, to think of this programme as divided into two principal parts; first, that concerned with public health and general sanitation; and, second, that involving considerations of more strictly personal hygiene.

Public health and general sanitation are, frequently, relatively remote considerations in reasonably well sanitated communities, not only for indigent families, but indeed for economically normal individuals as well. Ordinarily we don't look upon it as the responsibility of the individual citizen in our highly developed urban communities to provide himself with a satisfactory water and milk supply, an adequate sewage disposal system, a proper method of vital statistics recording, etc. This is the work of the health and medical authorities.

On the other hand, there are still many communities, particularly in outlying territories, where the observation of the rules of sanitation is still, to some extent, dependent upon the information and initiative of the individual. In these communities, at least, advice and instruction for him by means of personal suggestions, literature, and other devices, may be peculiarly pertinent. Consequently, in visiting homes of this kind, any representative of a community or social agency, whether it be health inspector, social worker, or public health nurse, should be familiar with and have in mind, certain essentials fundamental to the attainment of reasonable objectives in the public health programme. A few of these may be cited as follows:

1. The dangers that arise from the ingestion of surface waters or water from shallow wells or polluted streams.

2. The importance of safe and adequate excreta disposal, the value of sanitary privies, and where information may be obtained as to their construction.

3. The dangers associated with house flies and how the breeding of these insects may be controlled by hygienic methods for the disposal of human excreta, stable manure, etc.

4. The importance of home refrigeration for the protection of perishable food products, such as milk.

5. The significance of birth registration and the importance of vital statistics in general community record keeping.

In communities where these objects are being adequately attained, and

where a sanitary environment is being established, very material reductions of illness may be anticipated, which in turn necessarily will lessen the extent and degree of poverty with which the social worker will have to be concerned.

On the side of personal hygiene, we enter into a larger, more important, and more universal field, where it is convenient to think of our objectives as falling in two principal classes: those designed for disease prevention or control, and those for personal health promotion.

On the side of disease prevention or control, there are no doubt many considerations which will come readily to the mind of any experienced social worker and will be paramount in the view of a sanitarian concerned with personal hygiene. The more important of these may be touched upon as follows:

1. Medical Guidance.

It becomes more and more apparent that people of all classes, including those who are indigent or likely to become so, are, to an increasing extent, seeking advice and guidance as to how to avoid quackery and fraud in medical service, and as to how to find competent and legitimate medical treatment. Families in all walks of life tend to flounder seriously in this regard; to shop around from doctor to doctor; to fall into the hands of charlatans; to resort to expensive and ineffective advertised cures; and seriously to waste both the family's resources as well as the margin of opportunity for timely treatment and cure. Presumably the social worker cannot usually recommend an individual physician. She can, however, be familiar with the community's resources—the free or moderately priced clinic services both of a preventive and therapeutic character. She may even in some instances be able to establish a working relationship with an authoritative medical group through whose advice, and with whose backing, she may be able to give constructive personal medical guidance as to individual medical service. In any event, here lies a very important field for the effective limitation of preventable illness, and for the reduction of the inroads which illness makes in the family exchequer.

In this connection, it is the social worker who will have, under proper co-ordinated direction, a unique opportunity, as time goes on, to throw light upon the more or less hidden factor previously referred to, namely, the cost of illness. How much does the average family on the borderline of indigency now expend for medical service? It is anticipated that studies along this line may shortly be launched on an extensive scale, and undoubtedly those responsible for the inquiries will find the social worker a fruitful source of information.

2. Nursing Service.

It is obvious from the experience of the Metropolitan Life Insurance Company and other agencies that the visiting nurse service now provided in practically all communities of any size is by no means as yet used to its full

capacity. This bedside service is not only intended to care for those who are acutely ill, but is aimed at the hygienic instruction of the sick and well members of the family as well. The social worker who is aware of these facilities, who knows what the objects of the nursing service are, who knows under what conditions and circumstances certain groups of individuals are eligible for this service, can do a great deal to encourage its more extensive and effective application.

3. Personal Health Education Against Disease.

Still in the field of disease prevention, but having more to do with prevention than treatment, is the education that can and should be carried on in the home by all who enter its doors, on the fundamentals of personal hygiene. It is true that in many homes the equipment for hygienic living is lacking. Yet in the same homes, and indeed in many that are well equipped, the practice of personal hygiene is frequently more deficient than the equipment. It must be remembered that one would wager less on the longevity prospects of a human pig in a palace than on that of a careful individual in a hovel. The social worker and the nurse, in carrying these personal hygienic objectives into the home, will have in mind the importance of isolation of the ill, the desirability of avoiding unnecessary contacts, the hazards of bad respiratory hygiene, the importance of handwashing, the significance of careful disposal of sputum and body wastes, etc.

4. Vaccination.

I am uncertain whether or not there are any relief agencies in this country or the United States that make vaccination or the evidence of a recent vaccination scar, a pre-requisite to the acceptance of relief, but this would seem to be a not unreasonable consideration. Smallpox is by no means a negligible factor as a cause of sickness and death. In the first six months of 1927, for instance, there were in the United States 19,600 cases of this disease. In five provinces in Canada there were 599 cases. An entirely unnecessary cause of illness and sickness costs, both to the individual and to the community, under circumstances where we have, for our universal use, a simple and safe means of prevention, smallpox is scarcely to be tolerated where agencies are expending funds for the care of families unable to meet their own immediate obligations.

5. Diphtheria Immunization.

As everyone knows, practically every state and community throughout Canada and the United States are carrying on a diphtheria immunization campaign. Here is a disease which, for practical purposes, we know a great deal about. We know how it is caused, how it is spread, how it may be cured, and how it may be prevented. The immunization message needs to be carried into every home by any and everyone who has an opportunity to deliver the message.

There is no question as to the effectiveness of toxin-antitoxin or toxoid,

in limiting diphtheria. An increasing number of communities are reporting periods of several years without a death from this disease as the percentage of immunizations increases. The extensive epidemic that spread over many sections of the continent during 1927 would undoubtedly have reached much more extensive proportions had it not been for the limitations placed upon its invasion by prior immunizations. This was pointed out very clearly by the experience in New York State, where much more extensive work, particularly among pre-school children, has been carried out during the last two years in the up-state areas than in the city itself. The following statistical evidence is to the point. The percentage increase in cases in New York City in 1927 over 1926 was 73.2, whereas the corresponding figure for the rest of the State was only 7.9. The 1927 deaths increased over 1926 in the city by 50.3%, whereas up-state the increase was 5.6%.

Most communities encourage those normally situated to go to their physicians and pay for the immunization service. However, at this stage of the campaign, in practically all places, there are public clinics for school and pre-school children where indigents as well as others may be treated. It would seem to be quite legitimate to say that no relief agency had completely done its job in any family where it had not laid this fundamental basis for the future well-being and protection of its members against the costly inroads of this entirely preventable disease.

Perhaps not as extensively, but to the same degree under certain circumstances at least, the social worker should be familiar with current knowledge and practice concerning typhoid immunization, the use of the convalescent measles serum, the use of scarlet fever toxin for active immunization and scarlet fever antitoxin for treatment, and with similar measures as experience develops and perfects them.

6. Venereal Disease.

The social worker is of course familiar with the venereal disease problem, and has to meet it under distressing circumstances almost daily. The importance of being acquainted with available diagnostic and treatment facilities, and with the time and other limitations which must be placed upon the accomplishment of a successful therapeutic régime with reference to these diseases, must be obvious to all who realize that one of these diseases alone, syphilis, is responsible for certainly a majority of the hundreds of thousands of individuals burdening society as inmates of institutions for the insane, or handicapping families through an infliction of their mental defects and abnormalities upon the home.

On the positive side of health promotion, there are many considerations of material importance. Some of these are less pertinent in character and perhaps less easy of accomplishment than the disease preventive measures previously commented upon. They are phases of constructive personal

hygiene or so-called positive health. Sickness is a luxury for most of us and one which a family in poverty can certainly ill afford. Prevention, particularly where the means are simple and obvious, is so much less costly as to render its negligence economically criminal. At the same time, though perhaps the argument is not quite so conclusive, the conservation of health by known positive means would seem to be, on the whole, vital and necessary to the family in hazardous economic circumstances. Consequently, the social worker has a tremendous opportunity in the promotion of creative health activities if she is familiar with the few fundamental principles involved and if she is ingenious at their local application—an objective to be accomplished largely through education, demonstration, example, the use of literature, and similar devices. On the side of health promotion, we would like to take time to mention three general considerations:

1. Periodic Health Examinations.

As practically all social and health workers have now recognized, this is a fundamental consideration in personal hygiene, and is, indeed, the keystone of the personal health programme for individuals in all social and economic groups. Its value has been demonstrated in many different ways. The problem is how to provide the service for all types of families, especially for those who are financially under par, where the use of the private practitioner is impracticable. There are, however, being established, in the United States at least, an increasing number of health examination clinics and services where this procedure is offered for very modest fees. It is my impression that a number of charitable societies and relief agencies are endeavouring, in certain groups at least, to provide this service for indigent families. This would seem to be a most logical procedure as a diagnostic measure in the study of the family's economic ills. It should certainly be considered a primary step in rehabilitation as the family emerges from the economic woods. The health examination, periodic if possible, means the early detection of diseases such as tuberculosis and cancer, the providing of hygienic advice as to living practices and methods, and the re-assurance of those who are found free from disease and defect. It is equally important for the child and adult.

2. Positive Health Practices of Personal and Home Environmental Importance.

Here there might be discussed a great many matters of varying importance, most of which cost little or nothing, and certainly involve an outlay considerably less than the price of ignorance. Fresh air in most homes, except under extremely severe weather conditions, is practicable. A maximum indoor temperature of 70° during the cooler seasons is a consideration which social workers can under many circumstances urge upon their families. The value of outdoor exercise and of outdoor play for children can certainly be

kept in mind, even though there are circumstances where their encouragement may be inappropriate. Except in dark room tenements, the windows of sleeping rooms can still be opened, and adequate rest for adults and children is a fundamental principle of hygiene from the benefits of which very few need be deprived. The dietitians tell us that a balanced dietary is frequently less costly than the unwise food habits of many families, rich or poor. The economic and hygienic value of milk as an element in the diet constitutes a factor for wider dissemination through educational channels. It costs nothing for children and adults to have a regular bowel movement, to sit, stand, and walk erect. Sunshine and cod liver oil do cost something, but they are probably worth the investment as anti-rachitic measures.

On the whole, it costs less to live according to a few of the important rules of personal hygiene, even if this includes the cost of a periodic health examination, than it does to pay doctors' bills for preventable illness.

3. Mental Health and Right Thinking.

There is undoubtedly a great deal also that the social worker can do to affect the state of mental health on the part of the members of the family with whom she comes in contact. Of course the health of the brain is affected by the physical conditions previously referred to. Disease germs and poisons destroy brain cells just as they do other body tissues. But it would seem to be important to remember that our brains are injured not only by poisons but by handicapped and defective methods of thinking as well. How important in indigency are the hysterias, neurasthenias, nervous prostrations, nervous indigestions, and other functional defects that are in turn, in part at least, the result of bad mental habits! Is there anything that the social worker as guide and teacher can do to affect these irritating if not etiological factors of indigency? We can at least remember that good habits are as pleasant as bad habits; that bad mental habits use our energy in getting us where we don't want to go; that all the energy that we spend in worry, fear, shame, and make-believe uses up our working capital. If we are instructing a family about a quart of milk a day for the children, let us remember that angry food does not digest, and that shame is constipating. Let us endeavour to keep in mind for ourselves, as well as for those we are attempting to influence, the importance of such healthy mental habits as the expectation of accomplishing the thing attempted, the ability for deciding what to do and then attempting to do it, the habit of "sticking to it", and the habit of being interested in all ideas and experiences and fearful of none.

These would seem to be some of the objectives for the attainment of which the social worker has unusual opportunities—objectives which if attained would materially lessen the severity and volume of her problem. We have said little, though have perhaps implied much, as to methods of attainment. Every social worker is, of course, aware of the extent to which

social agencies in his or her community, such as Health Departments, clinics, hospitals, schools and other organizations, provide facilities for attaining these ends. Every social worker should be familiar with these provisions as well as with the special campaigns which are initiated from time to time, the success of which depends in large measure upon her co-operation. If she knows and uses her resources—Health Department facilities, clinics, sanatoria, health stations, physicians, nursing services, literature—she will be employing the disease preventive and health promotive armamentarium of the social worker. She will be serving as the most valuable channel for the interpretation and application of these facilities to the home and the individual. The programme for health promotion among all groups of the population is very apt to prove abortive without this practical translation of community and individual health ideals into a concrete body of instruction, guidance, and service.

We should all, of course, keep in mind the larger objects of the programme. It is, I believe, true that sickness is the single greatest cause of poverty and economic failure. As Mr. Burritt of New York City stated several years ago: " . . . if these factors (the preventable diseases) were removed, most poverty would be eliminated." Undoubtedly sickness, and the tragic unnecessary deaths, cause most of the sorrow and destitution in the world. Yet we should remember that health alone won't make a good life. Health is not all we need. Health is a means, not an end. Health is not just the absence of sickness. Health is the vigorous, beautiful, smooth-running, efficient operation of the mind and body, of the instincts and the will, in a harmony of purpose and accomplishment.

We should, perhaps, also remember that while it is important for the social worker in attaining this broader objective, to teach sanitation, to facilitate disease prevention, and to promote personal hygiene, yet perhaps the is doing her biggest job when, through these and other creative and remedial means, she restores the family to a sound economic status, balances the budget, adjusts the occupational factors, and thus lays a permanent social and economic basis for health. The relation between individual and family income and health is inevitable. Good wages and good health are repetitive steps in the ascending stairway to economic and hygienic stability. Inadequate incomes and illness are recurrent and cumulative factors in the reverse, descending spiral into the regions of destitution and disease. This consideration is basic and probably overshadows all else in family welfare work.

In the degree to which the social worker recognizes and uses all of these interlocking hygienic and economic factors; in the degree to which she employs these instruments to supplement her routine relief and medical facilities in mitigating the great load of preventable sickness and premature death; to that extent does she serve as a vital instrument in laying a physical foundation for the elimination of poverty and illness, and for the furnishing of a physical basis for social and economic growth and stability.

Diphtheria Toxoid (Anatoxine-Ramon)*

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BEFORE discussing the nature of diphtheria toxoid and the use and value of this product in the prevention and control of diphtheria, it may be worth while to consider briefly one or two of the well known facts concerning this disease.

As we scan the toll of deaths from diphtheria year by year for the past twenty or thirty years, we are impressed on the one hand by the number of these deaths, and on the other, by the remarkable reduction which followed the discovery of diphtheria antitoxin in 1894 and its general use in later years. In every country where diphtheria antitoxin has been made available for the treatment of diphtheria, the death-rate has fallen in the same remarkable manner. We all know that if a patient suffering from this disease is seen by a physician within a day of the onset of the disease, and if antitoxin is given in an adequate amount, prompt recovery is almost invariably the rule.

There is of course that little word "if"—if seen early by a physician. In an investigation of 100 deaths from this disease which occurred in Ontario in 1920, FitzGerald found that the chief cause of these deaths was delay on the part of the parents in calling a physician, chiefly because the parents thought that the child was suffering "only from a sore throat". Similarly, the findings of Carey, in a study of 1,000 deaths from diphtheria in Massachusetts, showed that almost thirty-three per cent of these deaths occurred in the case of persons who had been ill for more than a week before a physician was called, and an additional twenty per cent of the patients who died were moribund when the physician arrived. The insidious character of the disease, as shown by these studies, brings home to physicians and public health workers the need for the specific protection of every young child by the use of toxin-antitoxin mixture or toxoid, or, if one prefers the expression, by vaccination against diphtheria.

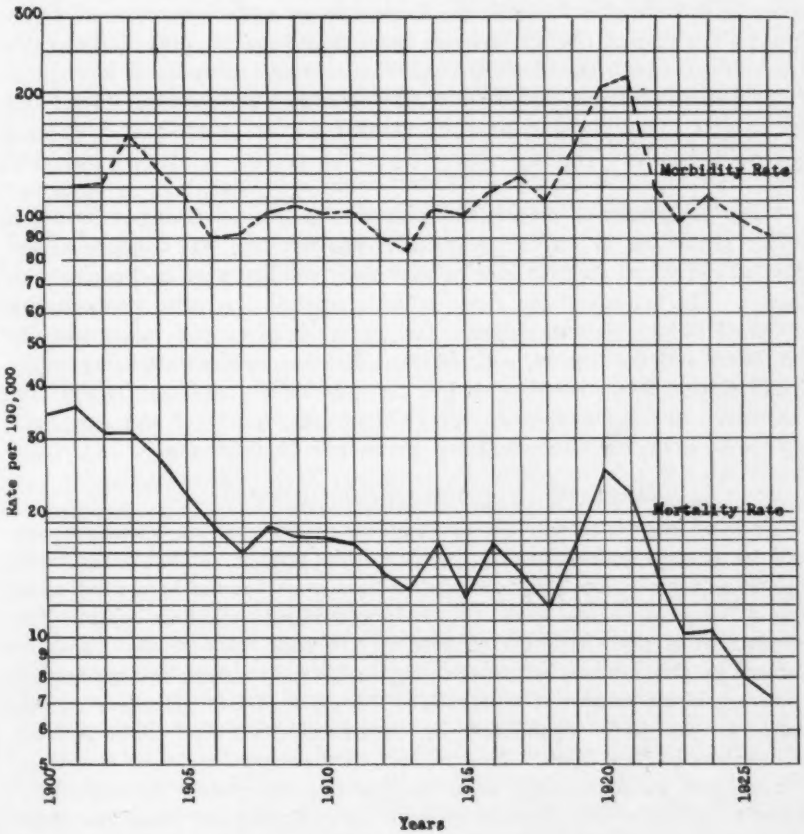
If the great reduction in mortality rate only in the past thirty years be considered, an impression might be given that diphtheria is being wiped out. Morbidity statistics, however, indicate that the incidence of the disease has

*From the Department of Epidemiology and Vital Statistics, School of Hygiene, University of Toronto.

Read at the Michigan Public health Conference, Lansing, Mich., Jan. 11, 12 and 13, 1928.

shown little or no evidence of decline, in striking contrast to the mortality rate which has fallen in such a remarkable manner. The accompanying graph shows the trend of morbidity and mortality in Ontario from 1900 to 1926. Efforts to control diphtheria by isolation and proper care of patients and of

DIPHTHERIA MORBIDITY AND MORTALITY RATES, ONTARIO, 1900-1926



carriers, by passive immunization of contacts, and by other measures of control, have not been sufficient to reduce the incidence. The introduction of diphtheria toxin-antitoxin mixture, and later of diphtheria toxoid, has afforded a definite means for the control of this disease.

Age is an Important Factor in Diphtheria

One is impressed, in even a superficial study of the statistical data of this disease, by the importance of age as a factor, both in morbidity and

mortality. In Ontario, for instance, in the five-year period 1921-1925, approximately one out of every six deaths among children in the age group of 2 to 14 years was due to diphtheria. In the age group 1 to 14 years diphtheria occupied the third place in the list of all the causes of deaths, arranged according to numerical importance. Statistics of many states, cities and towns indicate that often more than half of all deaths from this disease occur in children under five years of age. If we add the number of deaths in the sixth year of life we find that more than sixty per cent of the deaths from this disease occur in the pre-school age group. Deacon, in a study of diphtheria in Michigan, based on 31,028 cases and 2,458 deaths, found that one-half of all these deaths occurred under five years, namely, at four years and eight months. The highest single year of age for deaths was the third year.

The importance of the immunization of this group is being realized and family physicians in increasing numbers are advising the mothers of the children committed to their care to have their children protected against this disease. The pre-school age group is being reached also when immunization of school children is undertaken. The mother is given full information by the doctor and the teacher, and, deciding that her children attending school should receive this protection, desires that the kiddies at home be similarly protected. Active immunization of children, particularly of the pre-school age group, is the logical method for the control of diphtheria.

Development of Methods of Immunization

It is of interest to note the development of the methods which are now used to produce active immunity against this disease. Diphtheria toxin, without its toxic action being modified in some way, has not been used, apart from a few experimental trials, for the immunization of human beings. The introduction of toxin-antitoxin mixture by Theobald Smith in 1907, and the first use of this product by von Behring in 1913, in human beings, marked a new era in the control of diphtheria. The value of this procedure on this continent was early established by the notable work of Park and his collaborators in New York. This product, as the name implies, is a mixture of toxin and antitoxin,—the toxin being almost completely neutralized by antitoxin. Physical and chemical methods of modifying the toxin have been sought for, and in 1921 and 1923 Glenny and his collaborators in England proposed that toxin treated with formalin be used for the purpose of human active immunization.

Ramon, of the Pasteur Institute, in 1923 and 1924, prepared formalinized toxin which was completely atoxic, and he established its value by the successful immunization of children. Ramon showed conclusively that, although the toxin had lost all of its toxic character, as ordinarily measured by guinea-pig inoculation, it retained its immunizing power. The name "anatoxine" has been given by Ramon to his product and the English workers have used the

term "toxoid" for their product. The product distributed in Canada has borne therefore the name "Diphtheria Toxoid" and in brackets "Anatoxine-Ramon."

It is important to note the essential differences between toxin-antitoxin mixture and toxoid. Diphtheria toxoid contains no antitoxin (serum) and is therefore to be preferred to toxin-antitoxin mixture because there is no possibility of sensitizing an individual by injections of toxoid to horse or other animal serum. The production of skin sensitivity to horse serum in individuals who previously gave negative skin tests, has been shown to occur following the injections of toxin-antitoxin mixture in a percentage of persons receiving the treatment. The significance, however, of such skin sensitivity has not been clearly determined, for clinical experience in the administration of various sera has shown that marked reactions are not entirely confined to the group of persons who give evidence of hypersensitiveness as determined by skin testing. The use of diphtheria toxoid is therefore to be preferred to toxin-antitoxin mixture since the question of possible sensitization with serum does not arise.

Diphtheria toxoid further differs from toxin-antitoxin mixture by being atoxic. A quantity of five cc. of this product may be injected into a guinea-pig without evidence of any reaction. In connection with the preparation and testing of diphtheria toxoid, successful immunization of laboratory animals has been considered absolutely essential before any lot has been released for human use. This testing of the antigenic value has prevented the possibility of toxoid of poor immunizing power being distributed.

Preparation of Diphtheria Toxoid

Diphtheria toxoid is prepared in the Connaught Laboratories, University of Toronto, according to the method of Ramon as modified by Moloney. A potent diphtheria toxin is the first essential. This is prepared by growing a suitable strain of the diphtheria bacillus in veal infusion broth for a period of six or seven days, after which time the bacteria are removed by filtration. No phenol, cresol, or other like preservative is added because it has been found that the addition of such substances destroys to a large degree the antigenic power of the final product. The toxin should contain at lease 400 M.L.D.'s per cc. Toxin of weaker strength has not been found suitable for the preparation of potent toxoid.

The detoxification is accomplished by the addition of a suitable amount of formalin and by holding this formalinized toxin at 37°C. for a period varying from one to four weeks. It has been shown by Moloney and Weld that there are at least two factors of importance which determine the rate of detoxification of the mixture. These factors are the concentration of the formalin and the pH of the toxin mixture. Glenny has shown that increasing the amount of formalin added shortens the period of heating required to

complete the detoxification. Moloney and Weld confirmed this and determined that a concentration of 0.4 per cent of formalin is most satisfactory, permitting of a fairly rapid detoxification without impairment of the antigenic value. They found that the optimum pH of the mixture is from 8.0 to 8.3. In connection with the use of commercial formalin, Moloney recommends that the strength of formaldehyde contained be determined before it is added to the toxin, as frequently the strength is less than 40 per cent.

The period of heating varies from one to four weeks. It is necessary, therefore, to make preliminary tests of the material from time to time during the period of heating to determine when the detoxification process is complete. The toxin mixture should be removed at once from the incubator when tests show that it is practically atoxic. Moloney recommends in carrying out such a test that 0.1 cc. of the undiluted toxin mixture and 0.1 cc. of a 1 in 5 and 1 in 25 dilution be injected intradermally into a guinea-pig. If the area of reaction in the course of 48 hours around the site of injection of the undiluted toxin is 12 mm. or less and if the areas of reaction around the injections of the diluted toxin mixture are 5 mm. or less, the detoxification process is considered complete. The contents of the various bottles, constituting one lot, are then pooled and filtered through Berkefeld candles into sterile containers.

Essential Laboratory Tests

It is essential that the product be tested for sterility, toxicity and antigenic value. Sterility tests, including the testing for the possible presence of moulds, are made of samples from each bulk container and from "filled" vials. The finished toxoid must be atoxic. To determine this, it is recommended by Moloney that five guinea-pigs be each injected with 5 cc. of the final product and be observed for one month. At least four of the animals must remain normal without loss of weight. A rapid method for determining the atoxicity of the product by intradermal testing, using guinea-pigs, is also used by him, but the use of this method is reserved as a final check on each lot of filled containers.

The antigenic value of each preparation of toxoid may be accurately determined by the following method, as advised by Moloney. Five guinea-pigs, weighing from 300 to 320 grams, are each injected with 0.5 cc. of the toxoid to be tested. At the end of a month the animals are Schick tested and in the following week 5 M.L.D.'s of diphtheria toxin are injected into each animal. At least four of the animals must survive. The Schick test thus gives preliminary and confirmatory evidence regarding the immunizing value.

When sterility, toxicity and potency tests are completed, the toxoid is filled into either ampoules or vials with rubber stoppers. In addition to the final sterility tests on the filled containers, a final toxicity test on each "filling" is carried out as a routine, as previously mentioned. This test consists of the injection intradermally into guinea-pigs of 0.1 cc. of undiluted toxoid and of a 1 in 10 dilution. A very small area of reaction, not exceeding 5 mm., is

usually seen when diluted toxoid is injected, and an area not exceeding 12 mm. when undiluted toxoid is used. This final toxicity test is solely for the purpose of making certain that no possible error has occurred in the handling of the toxoid.

Toxoid prepared according to this method has been found to be a satisfactory and stable product possessing excellent immunizing power. The preparation of this product is relatively simple, but if a potent toxoid is to be prepared, it is essential that only a strong toxin be used, that the detoxification process be carried out under uniform conditions, and that no phenol be added either to the original toxin or to the finished toxoid. Although no additional preservative has been added to any of the preparations of toxoid distributed in Canada, it has been found, after an experience of two and one-half years of widespread distribution, that the product is not easily contaminated and that the content of formalin renders the product unsuitable to the growth of organisms. The stability of the product has been established by thorough investigation. It has not been rendered toxic by freezing or other physical changes or by the addition of any chemical agent.

The Use of Toxoid

The method employed for human active immunization with toxoid consists in the administration of three doses, by subcutaneous injection, with an interval between the doses of from two to four weeks. Martin and Loiseau, in a recent summary of the French experience with toxoid, state that three injections should be given, namely, 0.5 cc. for the first injection, 1 cc. for the second and 1.5 cc. for the third injection. The interval between the injections should be not less than two weeks and preference is expressed for an interval of three weeks. Preliminary studies in our laboratory indicated the excellent immunizing value of toxoid, and in consequence an extended trial was made of the use of two doses only. The dose given in each injection was 0.5 cc. By July 1927, sufficient evidence had been collected to indicate that two doses of 0.5 cc. immunized from 70 per cent to 80 per cent of the persons treated.

Bloomberg and Fleming in Montreal, and Moloney and Fraser in Toronto, in controlled observations found about 70 per cent to be immunized by this method. The latter observers made a careful study of the immunity status of a group of 141 girls, ranging in age from 10 to 14 years. Titration of the actual antitoxic content of the blood was made in each case as well as a Schick test. Those who were Schick positive or had less than 1/50 of a unit of antitoxin were given two doses of toxoid of 0.5 cc. each and were retested one and one-half months after the second dose. The retest was controlled by titration of the antitoxin content. As a result of the evidence obtained, three doses are now recommended, namely, a first dose of 0.5 cc., a second of like quantity and a third dose of 1 cc. Roubinovitch, Loiseau and Laffaille, in France, state that they have successfully immunized 98 per cent of those treated, using three doses of toxoid.

Reactions

Diphtheria toxin which is the basis of both toxin-antitoxin mixture and toxoid contains, in addition to the toxin itself, certain proteins derived from the original veal broth and from the autolysis of diphtheria bacilli during the incubation period. It is not surprising therefore that, among those who receive injections of either toxin-antitoxin mixture or toxoid, there will be persons who manifest a marked reaction to these proteins. The presence of these substances in diphtheria toxin and of the reaction elicited by them has rendered the interpretation of the Schick test a difficult matter in a percentage of all persons who are tested.

These reactions have been termed pseudo-reactions and in Schick testing, a control test, of toxin heated or otherwise modified, must be performed before an intelligent interpretation of the toxin reaction can be made. It is well known that in young children these pseudo-reactions seldom occur, whereas in adults their occurrence is frequent. Experience with toxin-antitoxin mixture has shown that reactions, following the injection of the mixture, have occurred almost entirely among persons who have presented a marked pseudo-reaction when Schick tested. The experience with toxoid is in entire accord with these observations. In older children, and particularly in adults, marked reactions may occur. Such reactions consist of induration with an area of redness extending for several inches around the site of injection together with malaise, headache, and fever.

In Windsor, Ontario, Dr. Adams, Medical Officer of Health, has undertaken, since 1925, the immunization of a very large percentage of the primary school population, having given more than 25,000 inoculations. He has reported that only one out of thirty of the children inoculated had a reaction which kept them from school for one or two days. It is most gratifying to report that, although a quantity of toxoid sufficient for the immunization of 200,000 has been sent out from the laboratories during the past two years, practically no reports have been received of marked reactions.

The Reaction Test.

The control test in the Schick test is essential in interpreting the Schick reaction, but it may serve also to identify those individuals, who if injected with toxin-antitoxin or toxoid will give a marked reaction.

As many injections of toxin-antitoxin or of toxoid are given without preliminary Schick testing, it was considered desirable, in the distribution of toxoid, to place in each package of this product a vial containing a 1 in 20 dilution of toxoid for preliminary testing of the persons to be immunized. This diluted toxoid was found to be more satisfactory than heated toxin, which is ordinarily used as the control in the Schick test. It is recommended that 0.1 cc. of this diluted toxoid be injected intradermally three days before administration of the first dose of toxoid. If no local area of redness or an area less than one-half an inch in diameter is evident within three days, the regular toxoid injections may be given. The most suitable name therefore that could be given to this test to express its purpose is the "Reaction Test".

Widespread use of this test and of toxoid has shown that children under six years seldom, if ever, give any evidence of a reaction, and that under eight years a reaction is very rare indeed. The freedom from reactions in the younger age group which stand in the greatest need of protection emphasizes the desirability of concentrating our organized efforts on the immunization of young children. The occurrence of occasional reactions in children in primary schools is to be expected as with toxin-antitoxin, but the opinion of the health officers varies as to the necessity of carrying out the reaction test before giving toxoid to school children. In one large city more than 20,000 school children have been tested with the reaction test and it has been found that 10 per cent gave a positive reaction. Dr. Adams in the immunization of school children in Windsor did not use the preliminary reaction test. He is of the opinion that occurrence of reactions with toxoid in this group of the population is not sufficiently frequent or important to warrant preliminary testing for possible "reactors". The experience of other health officers in Canada can be given which bears out the statement that reactions are probably not more common with toxoid than with toxin-antitoxin mixture in this age group.

In view, however, of the occurrence of marked reactions in older children and in adults, it is urged that the reaction test be performed before toxoid is given to such persons. In regard to children under six years of age the possibility of reaction in those who show food idiosyncrasy or asthmatic tendencies should be considered and the reaction test performed in such persons. It is, therefore, a very simple matter to identify "reactors" before administrating toxoid by first carrying out the reaction test and thus avoiding the occurrence of reactions.

Immunization of "Reactors".

In a study of the "reaction test" in two groups of pupil nurses in a large city hospital, it is interesting to note that in a group of seventy nurses, tested shortly after their entrance into the hospital, 16 per cent gave a positive test. Testing of a larger group of 300 nurses who had been in training for more than a year in the same hospital, showed that approximately 24 per cent could be classed as "'reactors". It would seem, therefore, that the contact of the nurses with patients and others in the hospital tended to increase the number giving the positive reactions.

S. F. Dudley, in a critical study of the Schick test, states that it is generally inferred that the pseudo-reaction is caused by previous sensitization with some product of the diphtheria bacilli. "New" boys, in a school studied, gave only 9 per cent pseudo-reactors as compared with the occurrence of 24 per cent in the "old" boys. Dudley believes from his observations that the pseudo-reaction is more commonly found in those immune than in those susceptible, and also that many of the individuals who gave a positive Schick test and presented also a pseudo-reaction became immune in the course of some months without specific treatment.

This is in accord with our experience that "reactors" are more readily immunized than non-reactors. Very small doses of toxoid are required to accomplish a definite antitoxic immunity in such persons. The immunization of persons who give a positive "reaction test" may be undertaken without fear of reaction, providing that much smaller doses are used. For the immunization of "reactors" it is recommended that a dose of 0.1 cc. of 1 in 5 dilution be given, and if no reaction occurs, a second dose may be given in a few days, of 0.1 cc. undiluted toxoid, and a third dose after an interval of three weeks, of 0.1 cc. of undiluted toxoid.

As previously mentioned in the immunization campaign in one large city, the "reaction test" was carried out as a routine measure. Many of the children who were classed as "reactors" were immunized by the use of three small doses of toxoid, and in no instance was a reaction of any significance recorded.

Duration of Immunity.

In reference to the duration of the immunity conferred by toxoid, it is believed that the immunity will last for a period of years. It has been shown by Schick testing of large groups of persons in cities that susceptibility in infancy is followed by the development of immunity in the majority of individuals by the time they have reached early adult life. This immunity which they have acquired, presumably by contact with the disease during childhood, is maintained in adult life. There is reason, therefore, to believe that the active immunity produced by diphtheria toxoid injections is of similar character and duration.

In conclusion, the use of diphtheria toxoid is warranted because the immunizing value of the product has been proven by laboratory and clinical trial, because the product is atoxic and stable, and, because of the absence of serum, there is no possibility of sensitizing the persons injected to any serum.

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The Quantitative Limitations of the Reductase Test*

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WITHIN the last few years there have appeared a number of papers on the use of the reductase test as a measure of the bacterial contamination of market milk. It is regrettable that a larger number of them do not contain more facts in contra-distinction to a plethora of opinion. This ranges all the way from that of ardent advocates who claim that the reductase test strictly parallels the agar plate counts, to that of those (and there recently have been several more in the literature) who claim that the reductase test has absolutely no such value and is utterly undependable.

Passing over the earlier work done in Europe, historically reviewed by Simmons, we are well acquainted particularly with the work of Hastings and his collaborators, and, in this country, with the number of papers that have been presented to this Association at the 1924, 1925 and 1926 meetings.

Recently a valuable contribution to this subject has been made from the laboratory of the Vermont Agricultural Experiment Station by Ellenberger and co-workers, which states that "the methylene blue reduction test proved to be a more accurate measure of milk quality than the agar plate count."

In the past four years we have made determinations of the bacterial content of milk by means of the methylene blue reduction test and agar plate counts and Breed direct counts to the extent of several thousand samples of market milk extending over several years. When we attempted to plot the methylene blue reduction times against the bacteria counts, we failed to find any correlation which was strong enough to be used for regulatory purposes. However, we did find that when we applied the reductase test to the milk of all our shippers for the purpose of ascertaining those milks whose agar plate counts exceeded one and a half million, and later those which exceeded one million (regulatory standards), we found that the methylene blue test was very helpful. As a result of compiling all of our data over a year, in order to ascertain the degree of compliance of the two methods, we found that classification of the milk by the reductase test accorded better with that of the agar colony counts than when the correlation was made in the warm months only, as is evidenced by the following table:

*Read before the Convention of the International Association of Dairy and Milk Inspectors, Toronto, October 1927.

DEGREE OF COMPLIANCE OF REDUCTASE TEST WITH AGAR PLATE AND BREED TEST IN DIFFERENT PERIODS. BALTIMORE, MD.

	May-September		Whole Year	
	No. of Samples	Percentage compliance	No. of Samples	Percentage compliance
1925.....	630	72%	——	——
1926.....	1671	76%	2578	84% (agar plate)
1927.....	675	75% (agar plate)	1349	82% (Breed)
	320	64% (Breed)	——	——

The above table indicates, for example, that during the summer months of 1925, 72 per cent. of our samples were shown by the reductase test in the period of two and one-half hours to be in excess of 1,000,000 organisms when the latter are determined by the agar plate count. During the summer period in 1926 there was 76 per cent. of such compliance, but when all of the non-reductions of samples in the winter months were added in, the general average of compliance was raised to 84 per cent.

A recalculation of the data submitted in the article by Ellenberger and his co-workers shows that compliance of the reductase test with the agar plate count method occurs in 87½ per cent. of the cases when the comparison is restricted to those samples whose germ-life is in excess of 1,000,000 as determined by the agar plate count.

In other words, Ellenberger's data and our own agree in that we can expect the reductase method to classify approximately 85 per cent. of those milks whose germ-life by the agar plate method is in excess of 1,000,000 per c.c. Control officers must recognize this degree of difference before taking any action of a regulatory character based on an assumption that both methods classify the same.

At first impression, it might be disappointing to consider that the two methods do not agree any closer than this, but we consider that this discrepancy is in favour of the dependability of the reductase method. Ellenberger shows clearly that when the reductase test is compared with the agar plate method as to the keeping quality of the milk, the reductase method "correlates much more closely than does the agar plate count". Furthermore, he finds that the reductase test shows one-seventh of the variability between check or duplicate tests that is shown by the agar plate method.

In our laboratory we have run 368 reduction tests in duplicate (368 pairs) and measured the reduction time from a minimum of 35 minutes to a maximum of four hours. In all of these tests, the reduction times coincided exactly within the reading period of five-minute intervals, except in one case when the reduction times were one hour and thirty minutes and one hour and forty-five minutes, respectively. Moreover, 1,200 samples agreed exactly to the extent that they did not reduce within the period for which they were examined, namely, two hours in some instances and two and a half hours in others.

The above considerations indicate that the reductase test affords a better basis of dependability and duplicatability than has been shown in numerous recent publications to be the case with agar plate counts, and that the discrepancy between the two should by no means be adjudged as detrimental to the reductase test but should be considered strictly on the basis of the facts, namely, that the reductase test agrees with 85 per cent. of the agar plate counts. However, it must be remembered that the agar plate method itself is subject to the influence of factors which are so great that unless early methods are taken to improve it, it will be increasingly discounted as a quantitative measure of sanitation.

ONTARIO HEALTH OFFICERS' ASSOCIATION

14th ANNUAL MEETING

JUNE 12th, 13th and 14th, 1928

Physics Building, University of Toronto

The 14th Annual meeting of the Ontario Health Officers' Association will be held in the Physics Building, University of Toronto, June 12th, 13th and 14th. From the present arrangements it would appear that a very interesting and instructive programme will be given to the Medical Officers of Health of the Province in attendance on this occasion. The subjects chosen for discussion include recent changes in the Public Health Act of Ontario, the cost of organization and demonstration of public health in small municipalities, and the newer biological products, while communicable disease control and epidemiology is to receive special attention. A question box will be available before and during the meetings for queries from the delegates, the morning of June 14th being devoted to the answering of same. Any Medical Officers wishing interviews with health workers or desirous of seeing particular health or medical research or demonstration work, should give ample notice to the executive, when an effort will be made to meet with all special requests. The executive for 1928 is as follows:—

President—Dr. W. J. Cook, M.O.H., Sudbury.

1st Vice-President—Dr. W. E. George, D.O.H., North Bay.

2nd Vice-President—Dr. W. L. Hutton, M.O.H., Brantford.

Secretary—Miss Mary Power, Director, Division of Public Health Education.

School Medical Services, City of Vancouver

HAROLD WHITE, M.D.
School Medical Officer, Vancouver, B.C.

THE earliest school health supervision seems to have been undertaken in France in 1833, and in Sweden in 1840, but the first well defined plan was carried out in Brussels in 1874. Boston was the first city in America to adopt medical inspection of school children. This was in the nature of an attempt to limit the spread of communicable diseases, and was begun in 1894. The prevalence of physical defects among school children was then noticed, most of which defects might have been prevented in early life. This led to general inspection by the school physicians.

The first nation-wide inspection, including physical examination of all school children, was made in England and Wales in 1907.

These examinations showed that while other physical defects were very numerous, dental defects were almost always found. It was believed then, as now, that these were responsible, directly or indirectly, for much preventable illness and disability; consequently dentists were appointed to make dental examinations. But the mere diagnosis of physical defects, and the notification of parents, without a follow-up system for treatment, was found to be of little avail. It was then that school nurses were appointed to undertake this work, and they have become an essential part in our system to-day.

DEVELOPMENT OF THE WORK IN VANCOUVER

Although school medical inspection was first undertaken in Canada at Pincher Creek, Alberta, in 1905, then in Montreal in 1906, and Halifax and Vancouver in 1907, probably the first school medical work done in Canada was that of Dr. Glen Campbell, who in 1902 held classes for Vancouver school teachers, and instructed them in the simple methods of detecting poor vision in their pupils. In Vancouver schools in 1907, one medical officer worked alone. In 1910 one school nurse was appointed. Conditions at that time may be judged by the fact that a general inspection of one school of about 700 pupils revealed ninety-one cases of pediculosis, (and about 90 parents objected). Last year only 186 cases were found among more than 22,000 children examined. This one item will show the improvement in cleanliness among the children in the past 17 years. In 1911 a second nurse and in 1912 a part-time, assistant, medical officer were appointed. In 1913 two more nurses, in 1917 a second half-time assistant medical officer and three more school nurses, and in 1918 another school nurse were appointed.

In 1922 the services of the two part-time assistant medical officers were dispensed with and two more nurses were added to the staff. Since then there have been one full-time medical officer and ten nurses, an eleventh being appointed recently. In 1922 an instructress in physical training was appointed to assist in remedial measures in case of minor deformities.

The total registration of pupils in Vancouver schools in 1927 was 21,735. The cost of the medical, dental, and nursing services for the year was $1.28 per pupil.

The Value of School Medical Services

It was early recognized that the curbing of epidemics, the prevention of preventable diseases, and the remedy of remediable diseases is good business. The per capita cost of educating the child is obtained by dividing the school budget by the total number of children registered. Provision must be made for one hundred per cent. of the children on the register, not for the seventy-five or eighty per cent. in attendance on a given day. If a child has to repeat a term, so much more accommodation must be provided. A reduction in the percentage of the retarded children means fewer school buildings and reduced overhead charges. If in a school population of 20,000 it costs $80 per year to educate each child, making a total of $1,600,000, and the average attendance is seventy-five per cent., then $400,000 is wasted yearly. If three-fifths of the twenty-five per cent. are absent directly from illness, then $240,000 is the amount annually lost in this way. Add to this the time lost by those present in body yet not receiving full benefit of school by reason of defective sight, defective hearing, and poor attention due to faulty habits of sleep, nutrition, and personal hygiene, and we see what a field there is here for true economy.

Organization of the Department

The staff consists of one medical officer, one head nurse, ten assistant nurses, one physical instructress, and one stenographer. The medical officer has general supervision of the department and attends to the medical work at the office after school hours. A time-table of school visits is arranged for the term's work. Each school principal is notified of the time allotted to his school. The majority of schools receive one-half day a month from the medical officer; some of the larger schools receive two half days. Much the same plan is carried out in arranging the work of the nurses. The city is divided into districts, and a nurse is assigned to each of these. The size of the district and the number of schools allotted to each nurse vary, and are governed by the type of people living in the district and by the school population. Some of the districts in the centre of the city are quite small in area, although the number of children under the nurses' care is large. In the crowded foreign districts there is much more work for the nurses than in the better-class residential areas. A time-table of visits to the schools is arranged for the nurses as for the medical officer, and each principal is notified.

As far as possible schools are visited by the nurses every day; where this cannot be arranged, visits are made three times a week.

There is in each school building, a medical room where all examinations and inspections are conducted. Each room is supplied with all necessary furniture and equipment, including a screen, scales, and a cupboard for simple medical supplies.

Each child is provided with a card on which is recorded the result of the examination. This card shows the record of the child's physical condition throughout his school and high school life, and follows him from school to school in case of transfer. When the child leaves the city or leaves school, his card is filed alphabetically in the medical office at the School Board Building, where it is available to continue the record should the child return; or it may be sent upon request to an out-of-town school where the child is attending. The importance of these records of the child's health and ill-health in studying his individual case, in making correct diagnoses, and in directing treatment, cannot be over-estimated. Consent of parents to the children's examinations need not be obtained. This saves much time and there is seldom any objection on the part of the parent.

The Work of the Medical Officer

The general plan aims at giving each child a complete physical examination twice during public school life and once during the high school period. As a routine the beginners and all pupils newly arrived in the city are examined by the medical officer, and as many as possible of the pupils of the entry classes are examined and given lectures on health. In the high schools all children taking part in any school sport and all new pupils are examined physically. Short talks upon the regaining or preserving good physical condition are given to groups. The medical officer also gives talks on sex hygiene to high school boys in small groups, and a senior nurse talks to the high school girls on this subject.

The physical examinations comprise the taking of height and weight, testing eyes and ears, examination of nose and throat, mouth and teeth, skin, scalp, heart, lungs, and the feet, in boys, for hernia. The examinations are conducted in the medical room, where strict privacy is maintained, and a really satisfactory examination of the heart and lungs can be made.

Several days before the examination of beginners, written invitations to be present are sent to the parents. An opportunity is thus provided for the parents to attend, should they so desire. We find the plan of inviting the parents to be present with the little ones much appreciated, and the medical officer is able to give first-hand advice upon the care of each individual child. It has been found that sixty-three per cent. of all treatments recommended are procured either privately or publicly. Many thousands of cases of minor defects are found and the parents warned, though no active treatment is urged at the time.

In addition to conducting the physical examinations, the medical officer examines any cases referred to him by the school nurses for special examination. Frequent examinations are also made of special cases which for any reason, such as the presence of abnormal heart conditions, are being kept under supervision. In some of the schools, first aid is taught to groups of boys by specially trained male teachers, and to girls by the nurses. The medical officer conducts the examinations in first aid leading to the diploma of St. John Ambulance Association.

The Work of the Nurses

Although physical examinations, as already described, are always done by the medical officer, the nurse has a responsibility in this connection also. Knowing when to expect the medical officer, the nurse makes the necessary preparations in advance. She notifies the teachers and sees that each child has a physical record card properly filled out. It is a help to the teachers in planning their work to know in advance that their time-table will be broken. Should it be a beginners' class that is to be examined, the nurse sends home with the children, several days previously, notifications to the parents and an invitation to them to be present. At the time of the examination the nurse sees that each child is properly prepared, makes all records, sends out notices to parents of defects found, and renders any assistance necessary.

Physical Inspection. The pupils in grades not receiving a physical examination from the medical officer, and who have been examined previously by the medical officer, receive a physical inspection from the nurse. This consists of inspection of hands, arms, and chest for evidence of rash, etc.; of the mouth for general conditions and carious teeth; of the throat for enlarged tonsils; of testing nasal-breathing for evidence of obstruction; of examination of neck for large cervical glands; and of testing the hearing and sight. The findings of these inspections are recorded on the pupil's physical record card. The nurse sends out notices for all cases of defective permanent teeth and discharging ears, but all other cases having conditions as anaemia, enlarged tonsils, defective vision, etc., signs or symptoms of heart or lung trouble, or a previous history of such, are referred to the medical officer for further examination. After the medical officer has examined these pupils and made the diagnoses, the nurse sends the notices to the parents. The system results in the saving of a great deal of the medical officer's time.

Routine Inspection. In addition to the physical examination or physical inspection, which is given only once a year, the nurses make a classroom inspection at least once a month of all children under their care. The purpose of this is to detect uncleanliness, skin disease, infectious diseases, or any incipient conditions, and to stimulate and encourage the formation of health habits. This inspection is given in the cloak-rooms, to the boys and girls separately, and usually takes from twenty to thirty minutes per class, according to the size of the class and the age of the children.

Health Talks. The teaching of health and the time allotted to it in the curriculum varies in different school systems, as does also the part taken in it by the school nurse. In our schools at the present time the teaching of health as required by the curriculum is done by the teachers, leaving it to the nurses to place the emphasis on the application to daily use. The nurses teach health in many ways and use many devices for interesting the children in health. Posters, health charts, competitions, contests, health plays, and stories are all used in health teaching. As a general rule the nurses give a health talk at the time of the monthly inspection of the classes. Only the older children are addressed by the medical officer, who explains the reasons for the health rules they have been taught. In the newly organized "Junior High Schools" a system of health education is being developed in which members of the staffs of other departments assist.

School Clinics. While it is not our policy to treat any children who are in a position to consult their family physician, nor to remove responsibility from the parents, still we find that there are always minor cases which must be looked after by the nurses, or a serious and unnecessary loss of school time will result. The nurses also render first aid in case of minor accidents, the medical officer attending major cases when possible. For this purpose each school is provided with a simple first-aid equipment and a few medical supplies.

Dental Clinics. Dental clinics in the school are of inestimable value in health work, providing as they do a means of treatment for those unable to afford the usual dental rates. In our clinics children are treated free, if necessary, or, if in a position to pay, small fees are charged. The nurses make all the necessary arrangements with the parents and also arrange the appointments with the clinics. No child is treated without the parents' consent, and no case treated free without the approval of the nurses, who investigate all applications for free treatment. The staff consists of four half-time dentists and two lady assistants.

Malnutrition and the Milk Service. As a means of overcoming malnutrition and underweight found among our school children we have established a milk service. Children who are ten per cent. or more underweight for their age and height or who show other symptoms of malnutrition are supplied with one pint of milk a day. Parents who are able to pay are expected to do so. The expense for the service of the needy cases is met by co-operating associations. This service has been in operation for eight years and has given very satisfactory results. Pupils taking milk are weighed each month and their progress noted on a chart; a small card, on which results are noted, is sent home to the parents, in order that they may be kept in touch with the progress made. All pupils receiving the benefit of this service are recommended for it by the medical officer or the school nurse. In addition to this supplemental feeding, every effort is made to remove any cause that may be contributing to under-nourishment.

Infectious Diseases. Although the City Health Department has control of the infectious diseases for the city, the School Medical Department co-operates with them to the extent of excluding from schools all suspicious cases, re-admitting all cases where no physician has been in attendance and visiting all suspected cases. The teachers and attendance officer report to the Medical Department all cases of illness, and these are visited. Should the illness prove to be of an infectious nature all necessary precautions are taken and the City Health Department notified. Our department is notified by the City Health Department of all cases reported to them occurring among school children. By this system unsuspected cases of infectious diseases are discovered.

When an infectious disease breaks out in a classroom, the room is visited frequently by a nurse until the expiration of the incubation period. All absentees are visited and the cause of absence ascertained. If the disease is diphtheria a culture is taken of the nose and throat of each child in the classroom and of all known contacts. By an arrangement with the Vancouver General Hospital the cultures are prepared and examined in their laboratories. The desk where the infected child sat, also the surrounding desks, are thoroughly washed inside and out with a disinfectant solution; the books of pupils suffering from scarlet fever, diphtheria, or smallpox are burned.

Early in 1927 an epidemic of rubella, comprising 2,434 cases, afforded opportunity to study this disease. It was found that no cases developed during the first 13 days of the incubation period; therefore, with the approval of the Provincial Medical Officer of Health, contacts were allowed to remain in school during the first twelve days after exposure, and were then excluded until the twenty-second day. In more than 2,000 contacts so dealt with, those developing the disease did so during the third week after exposure. Thus, calculated on the basis of two contacts for each case, more than 40,000 school days or 200 school years were saved in two months. These regulations have been extended to include mumps and chickenpox. To avoid confusion with Measles, the term "German measles" is now extinct in British Columbia and the term "rubella" is used.

Sanitary Supervision. The routine sanitary supervision of schools is entrusted to the nurses, special matters being attended to by the medical officer. The nurses' frequent visits to the school make it possible for them to keep a close oversight of conditions. Any adverse condition is reported on immediately, and a report of the condition of each school is sent to the School Board Offices, and to the principal, regularly once a month. All our schools are equipped with sanitary drinking fountains and supplied with paper towels.

Home Visits. The follow-up system is a most important feature of our work. Early in the history of medical inspection it was found that results secured through post-card notification alone were very poor, little or no notice being taken of post-cards in the great percentage of cases. Therefore, as one of the main objects of medical inspection was detection and correction

of physical defects, little was being accomplished. Realizing this, the authorities turned to the nurses, and the follow-up system is the result. It is the duty of the medical officer to make diagnoses, but the nurses are responsible for securing treatment.

Failure to provide treatment for children usually means ignorance, indifference, carelessness, or financial inability on the part of the parents. By home-visiting the nurses discover the reason for lack of treatment and so are able to deal with cases. They explain to the parents in as clear a manner as possible the nature of the children's complaints, and without causing needless alarm endeavour to impress the importance of having the effects remedied. We always advise that the family physician be consulted, but if it is found that financial circumstances will not permit of this, the nurses arrange for the children to be taken to the clinics or specialists for free treatment. Careful and thorough investigation of the needs is always made, not only to safeguard the hospitals and physicians, who assist in caring for the needy, but also to safeguard the people themselves. When parents can pay even a small amount they are encouraged and expected to do so. It is sometimes found that home conditions are responsible for the unhealthy state of the children. It is then the duty of the nurses to instruct and encourage the mothers in more healthful ways of living. The home visits afford the nurses many opportunities for teaching hygiene.

The nurses' follow-up work also results in a considerable saving of school time, as, in addition to visiting cases of physical defects, they visit cases excluded from school for skin diseases, verminous conditions, etc., explain the treatment prescribed by the family physician where necessary, and see that proper care is given and that the children are back in school without unnecessary delay. They also visit as many cases of reported illness as possible; see that proper care is given and that medical attention is provided when necessary. This, in addition to their visits made for suspected infectious diseases, keeps them closely in touch with the health conditions of their district and saves a great deal of school time.

In many ways our nurses are the social workers for the school. It has often been truly said that "The nurse is the link between the home and the school."

The nurses co-operate with all social agencies and refer to them any cases found in need of help of any kind which comes outside their scope. With the aid of the Parent-Teacher Associations, many children are, through the nurses, supplied with proper clothing and shoes; children who would otherwise lose much valuable time are thus kept in school. The Parent-Teacher Associations assist the nurses, when necessary, to provide special boots, surgical appliances, etc., for the needy cases. Through a special fund provided by the School Board, glasses are supplied for indigent cases.

Special Classes

For years the necessity for some means to carry out our recommendations regarding treatment of minor remediable deformities has been felt. In 1923 a start was made by the appointment of a person specially trained in this work. Classes are held now in twenty-seven of our schools. Parents are invited to be present at the first lesson, and their co-operation is enlisted, so that the prescribed exercises may be carried out at home. The improvement in most of the cases following the instruction is very apparent.

In March 1928 our first open-air school was started and is conducted on the usual lines. The open-air school provides for selected children, the maximum amount of fresh air and sunshine, a cool atmosphere, milk during school hours, a hot balanced meal at mid-day, followed by a sleep in the open-air, breathing exercises, organized play and special instruction in personal hygiene. The school accommodates seventy-two pupils and very gratifying results have been attained.

On February 13th, 1928, our first sight saving class was opened under a teacher highly trained and experienced in this work. This enterprise is too recent to permit of results being reported.

My acknowledgements are due to Miss Breeze, Head Nurse, for many data regarding the nursing activities.

PHYSICS BUILDING, UNIVERSITY OF TORONTO.
FOURTEENTH ANNUAL MEETING,
ONTARIO HEALTH OFFICERS' ASSOCIATION,
JUNE 12th, 13th, 14th, 1928.

Editorials

SAFETY FIRST AND THE CHILDREN

DISEASE, violence, and old age would appear to be the principal cause of deaths; disease causing about ninety-two per cent, violence four per cent, and old age four per cent, so wrote the late William T. Sedgwick in analysing the mortality figures for the United States in 1890. Does a similar distribution of the causes of death hold true now for Canada?

The practice of preventive medicine has reduced the deaths from tuberculosis, from typhoid fever, from infantile diarrhoea, and from other important preventable diseases, but there has been no decrease in the number of deaths from accidents and violence. On the contrary, there has been a steady increase in the toll of deaths from motor-car accidents and other accidents on the streets and highway. The safety movement has resulted in lessening the number of accidents in industry and in the home, but the safety movement has not been able to keep pace with the dangers associated with the rapidly increasing number of motor cars and other vehicles. Fatal accidents from motor cars have increased each year. In the United States the 1927 figure is more than eight times that for 1911, more than three times that of 1917, and has increased 67.6 per cent in the seven years since 1920. Again, thirty-five to forty per cent of all motor accidents concern children. Every movement, therefore, that may assist in reducing the number of these preventable deaths should receive the heartiest support from all who are interested in preventive medicine.

The organization of the "Just Kids Safety Club" deserves more than passing notice, for it is one of those happy inspirations from which much good may be expected. The best time to instill a proper attitude toward traffic and other dangers is in childhood, and the formation of the "Just Kids Safety Club" lends just that little touch which appeals to the children. The increase in the number of accidents, due in most part to carelessness on the part of either those driving cars or of those crossing the streets, might be greatly lessened by a little thoughtfulness and care, and by following the motto of the Club—"Look up and down before crossing the street".

TREATMENT AND PREVENTION

THE fact that treatment and prevention cannot be separated is a truth that is frequently lost sight of. Certain more or less arbitrary boundaries may be established, but this does not alter the fact. The individual or the organization interested in or responsible for the promotion of public health must have a real interest in the provision of adequate medical and nursing care for the sick. There is a limited value in a health service which centres its whole activity on the discovery of physical defects and which does not ensure that the necessary remedial services are available. The control of tuberculosis depends largely upon the proper treatment of the known case; the prevention of the spread of syphilis is largely a question of treatment to render the individual non-infectious. Adequate medical and nursing care before, during and after confinement is the solution of the prevention of maternal and early infancy mortality and morbidity. It is difficult to understand why a country that has accepted free education as a state responsibility should evade the acceptance of the principle of the provision of medical and nursing care, when required in the public interest, as a state responsibility. It may be that this responsibility should be met through some system of compulsory insurance. The essential point is that the state is responsible for seeing that every individual is given the treatment required to restore him to health and fitness, and so prevent the inefficiency that results from inadequately treated disease.

ANOTHER REASON FOR PASTEURIZATION

THE occurrence of contagious abortion in cattle has been recognized for many years as one of the problems in cattle breeding. It has been estimated, for instance, that at least thirty-five per cent of the cows in Michigan are infected with this disease. Surveys made in Connecticut indicate approximately the same degree of infection as in the state of Michigan. In Pennsylvania, in a small survey, sixty-five per cent of the market cows were found to be infected. For years it has been known that Malta fever has been spread to man through the drinking of milk from goats suffering from infection with the Micrococcus melitensis (now Brucella melitensis). Only within the past few years has it been shown that the causative agent of contagious abortion in cattle (Brucella abortus) and that of Malta fever (Brucella melitensis) are very closely related micro-organisms. Malta fever is a serious disease when it occurs in man, and is characterized clinically by continued fever and by frequent relapses. The wave-like type of fever, when present, is highly characteristic, and it is from this feature that the name undulant fever has been given to this disease by British writers. The disease must be differentiated from typhoid, arthritis, septicaemia,

pneumonia and other febrile conditions. The abortus type of infection produces in man a disease clinically indistinguishable from Malta fever due to Brucella melitensis, although, in general, cases are less severe and mild ambulant cases are common.

In the summer of 1922, in Phoenix, Arizona, the first epidemic of Malta fever in the United States was recognized. Thirty-seven cases were reported, and study of this epidemic showed that it was caused by the use of infected goat's milk. Some idea of the extent of Malta fever or undulant fever in the various states of the United States is being obtained by public health laboratories by the examination of blood samples submitted for Widal tests. In Michigan, studies made of such samples of blood showed last year that 11 out of 110 tests gave a positive reaction for infection with Brucella abortus. Similarly in Illinois in 1926, out of sixty-five specimens sent for tests, five were found negative for typhoid but positive for infection with Brucella abortus. Cases are now being reported of undulant fever in man from different states in the United States. Twenty-four cases have been reported by Carpenter of Ithaca, New York, with two deaths; nineteen cases from California, and sixteen cases from Michigan. Hardy has recently reported the diagnosing of thirty cases in three months in Iowa following the testing of blood samples sent for Widal test. It is to be hoped that an investigation of Widal samples for evidence of this infection will be carried out by laboratories in Canada in order that information concerning the possible occurrence of this disease in Canada may be obtained. In the investigation, therefore, of cases of continued fever, the possibility of infection with Brucella abortus arising from the drinking of unpasteurized milk should be remembered and appropriate laboratory tests should be made as aids in diagnosis.

Extensive laboratory and clinical studies must be conducted before definite statements can be made as to the relative importance of this disease and of its possible transmission by milk. But, with the suggestive epidemiological evidence already collected, it may be re-affirmed with even greater emphasis than in the past that unpasteurized milk is dangerous.

CHILD HYGIENE

H. E. Young, M.D., and J. T. Phair, M.B., D.P.H.

School Hygiene

THE establishment and maintenance of satisfactory accommodation for children of school age is a problem of major importance to the entire community. Certain factors of necessity influence the responsible authorities, not only in the building of schools, but also in such measures as are adopted for their upkeep. The present and future needs of the neighbourhood, the accessibility of the building in all seasons of the year and the amount of money to be expended, all have a direct bearing on the subject.

Interesting historical references are made to the types of school buildings which were existent in England in the middle and latter half of the last century, in the Annual Report of the Chief Medical Officer of the Board of Education of England and Wales, for the year 1925. The educational method in vogue at the moment was responsible for the type of building which was provided. No thought whatever was given to the question of health or sanitation; in fact, even comfort was apparently given scant consideration. The lack of adequate scientific knowledge of the subject of personal or community health available at that period was sufficient excuse for this apparent neglect, but it is hardly a reason for the seeming indifference which exists to-day. One is tempted to try and place the responsibility for the apathy with which the subject is viewed in all too many centres.

Did compulsory education with its associated financial outlay for plant and personnel, engender a spirit of antagonism to anything but the most meagre equipment? Does the fact that many of the most successful professional and business men of to-day received their primary education among these unsatisfactory surroundings influence the local authorities in their retention? Is it because of a lack of uniformity of opinion as to what constitutes satisfactory school hygiene, or is it because the gap between the mental and the physical has not as yet been sufficiently bridged? Would a more intimate contact between health and educational authorities help matters, or will it be necessary to wait until younger men or women supplant those now in authority? Whatever the reason may be, the fact remains that the question of the relation of school hygiene to the health of the individual child is frankly given insufficient consideration.

One of the contributing factors which is of sufficient importance to warrant some thought is the fact that School Boards which are made up almost entirely of individuals with no special knowledge of modern health practice, are left to the mercy of construction authorities and equipment

salesmen, who are almost equally unversed in the subject. We have further been satisfied in Canada to accept more or less arbitrary standards which were formulated to meet conditions presumably present in other countries, without any serious thought as to their applicability to Canadian conditions.

The first requisite is a greater amount of accurate scientific information on the subject. If it were possible to directly correlate the pronounced absence of adequate natural lighting in many schools with existing vision defect; or to state specifically to what extent the method of artificial ventilation in vogue was a contributing factor in the amount of respiratory disease among the pupils; or that the constant use of seats too small or too large for the children concerned, definitely affected their present or future health, then the health and educational authorities would be justified in adopting more stringent measures to ensure the correction of existing conditions.

It is hoped that at an early date some serious attempt will be made to obtain such information and that it will result in the arousing of a new interest in all those associated with educational affairs, as to the possibilities and limitations of the subject.

EPIDEMIOLOGY AND VITAL STATISTICS

A. C. Jost, M.D., and Neil E. McKinnon, M.B.

Report of the Department of Health, Hamilton, Ont.

A VERY excellent report for the city of Hamilton covering the past two years has been received. Dr. James Roberts, Health Officer, in prefacing the report for the year ending October 31st, 1927, states that—"the outstanding feature is our ability to announce the almost entire absence of diphtheria from this city". A graph printed in three colours shows the striking fall in mortality and incidence from this disease following the active immunization which was commenced in 1922. During the past year 60,000 inoculations were given without one serious infection resulting. Table I summarizes the data concerning diphtheria, incidence and mortality, in Hamilton from 1905 to 1927.

The Chest Clinic at the Health Centre is supervised by Dr. J. H. Holbrook, who notes the inauguration of a second Chest Clinic at the General Hospital. To this clinic, where the assistance of consultants, X-ray and laboratory services is available, cases of doubtful diagnosis are sent. The city's low mortality rate from tuberculosis of 49.5 per 100,000 is to be noted. Of 2,550 examinations at the Health Centre during the year, 812 were of new patients. Of these, physicians referred 318, public health nurses sent 267, school nurses sent 30, and 158 attended of their own accord or on the advice of friends.

Other sources accounted for 39. The Clinic recommended 208 cases for sanatorium treatment. In addition to the above examinations, 1,779 school or pre-school children were examined.

During the year, 215 cases were referred for analysis and study to the Mental Hygiene Clinic. The nursery school and kindergarten class (combined) has proven successful. In the report of the Social Hygiene Clinic, attention is drawn to a marked falling off in the number of treatments given for gonorrhoea in contrast to syphilis treatments, which showed a large increase in number.

For twenty-two years Dr. Roberts has been Health Officer for Hamilton. During that time he has given unstinted service to the city. That his efforts to improve health conditions have met with great success is evident from Table II. A decrease in twenty years of more than 25 per cent. in the general death-rate, and over 50 per cent in the infant mortality rate, is an accomplishment worthy of note and one of which Hamilton may well be proud.

TABLE I.

DIPHTHERIA, HAMILTON, 1905-1927*.

Average yearly number of cases and deaths for five-year periods.

Period	Population	Cases	Deaths
1905-9	61,916	818	83
1910-14	83,117	691	70
1915-19	104,847	1001	116
1920-24	116,466	2833	175
1924-27 (three years)	122,685	364	18

TABLE II.

AVERAGE ANNUAL DEATH-RATES. HAMILTON 1907-1927*.

Period	General death-rate (per 1000 population)	Infant mortality (per 1000 living births)
1907-1912	13.66	140.37
1912-1917	11.88	116.07
1917-1922	12.44	91.61
1922-1927	10.15	66.58

**The Departmental year ends October 31st.*

Malta Fever—A Public Health Problem

In Public Health Reports of March 2nd, 1928, A. V. Hardy, M.B., Epidemiologist for the State of Iowa, draws attention to Malta fever as a problem for municipal and state laboratories. The United States Public Health Service has noted that cases have been found in ten States, including New York State, Michigan and Pennsylvania. It is therefore altogether probable that cases in Canada will be noted in the near future. There is ample evidence that man may contract the disease, or one indistinguishable from it, from cattle as well as from goats, and for years there have been isolated in Canada, from cattle, specimens of B. abortus, which is closely related to, if not identical with, B. melitensis, the organism responsible for "Malta fever". The clinical picture at times so closely resembles that of typhoid fever, especially of the ambulant type, that it cannot be distinguished except by serological diagnosis. Specimens of blood from suspicious cases of typhoid fever that fail to give a positive Widal test should be tested for agglutination of melitensis organisms. In six months the Iowa State Laboratory found that blood submitted for Widal tests from thirty-eight patients gave negative Widal tests but positive agglutination tests with B. melitensis. Thirty-one of these on clinical and epidemiological evidence were confirmed as cases of Malta or undulant fever, and the diagnosis was further corroborated in two patients by repeated isolation of melitensis organisms from the blood. Seven cases are classed as unconfirmed, because they have not, as yet, been sufficiently studied. The significance of this disease as a public health problem is shown by the fact that the Iowa State Laboratories, in three months, reported positive Widal tests from forty-one cases, while specimens from thirty-one cases gave positive agglutination tests for Malta fever.

Rabies in Ontario

That rabies has increased in Ontario till it is now a serious problem, is shown by the fact that since the first of the year, 136 rabies vaccine treatments have been sent out by the Department of Health, Ontario, and that 7 heads, positive for rabies, have been found among those examined by the laboratories of the Department. As many heads have been sent for examination to the laboratories of the Veterinary Director General of the Department of Agriculture, Ottawa, the number of positive heads found in the province is greatly in excess of the number given here. The outbreak is not confined to one area but shows scattered foci in or near border cities. Windsor and Niagara districts have been epidemic centres, but the Kingston district is now the most serious. The Provincial Department of Health urges that unless much more stringent measures are instituted to cut off the source and limit the spread of the rabies now present, that the situation will become worse than this. All known human contacts have been located and given rabies vaccine.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—FEBRUARY, 1928

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria....	19	15	251	271	112	26	84	43
Scarlet Fever..	33	79	489	685	193	110	96	31
Measles.....	79	32	1,173	1,599	11	194	12	17
Whooping Cough.....	104	—	65	333	16	11	2	24
German Measles....	77	—	†	41	†	6	—	52
Mumps.....	14	—	†	4,244	67	282	9	124
Smallpox.....	—	1	52	204	—	58	11	36
Cerebrospinal Meningitis..	—	—	—	2	1	—	7	9
Anterior Poliomyelitis.	1	1	—	—	—	1	6	1
Typhoid Fever	9	5	80	41	3	3	21	4

In addition to the above the following cases were reported:—From Saskatchewan 26 of diphtheria "carrier", 3 of trachoma. From Ontario 7 of conjunctivitis acute, 1 of rabies, 74 of syphilis, 107 of gonorrhoea, 55 of septic sore throat, 939 of chickenpox, 6 of encephalitis.

*Excluding Prince Edward Island.

†Not notifiable.

Returns furnished by the Dominion Bureau of Statistics, Ottawa.

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA* BY PROVINCES—MARCH, 1928

Diseases	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria....	6	14	236	235	63	28	21	45
Scarlet Fever..	52	113	384	667	175	80	135	50
Measles.....	27	26	1,378	2,299	63	385	37	34
Whooping Cough.....	60	—	104	422	17	25	—	48
German Measles.....	57	—	†	42	†	10	1	3
Mumps.....	19	—	†	5,477	67	362	5	184
Smallpox.....	—	—	119	130	—	68	57	112
Cerebrospinal Meningitis..	—	—	3	2	1	—	1	1
Anterior Poliomyelitis	—	—	1	2	—	—	—	1
Typhoid Fever	2	14	63	40	5	1	16	1

†Not reportable.

*Excluding Prince Edward Island.

Returns furnished by the Dominion Bureau of Statistics, Ottawa.

PUBLIC HEALTH NURSING

RUBY M. SIMPSON, REG.N., AND FLORENCE H. M. EMORY, REG.N.

THE COUNTY HEALTH UNIT IN QUEBEC AS SEEN BY A PUBLIC HEALTH NURSE

ACCORDING to the report of the Quebec Provincial Bureau of Health for the year 1926-27, four county health units are functioning and plans are under way for four more units. In instituting this system for spreading the gospel of public health the Province of Quebec has taken the lead. The county health unit has for its purpose the popularization of hygiene in general throughout rural districts by giving instruction in the means of disease prevention. Particular attention is always given to combating tuberculosis and infant mortality. It has been the policy of the Provincial Bureau of Health to gain the co-operation of the clergy, mayors, school commissioners, and the local physicians as the first step in the establishment of the county health unit, which is yet a new and unfamiliar organization. In Beauce County the staff consists of a physician in charge, two public health nurses, a sanitary engineer and a secretary; while in St. John County the staff is comprised of a medical director, two public health nurses, a food inspector, a health inspector and a secretary. In each case the physician in charge and the two public health nurses, through the generous co-operation of the Rockefeller Foundation, were given special study trips of from two to three months' duration in the state of Ohio, where the county health unit is especially well developed.

The writer of this article having had no personal experience in county health work, felt it would be advisable to get first-hand information from a nurse who is actually doing such work, and, accordingly, she wrote to Miss Annonciade Martineau, the head nurse at Roberval, Quebec, in the Lake St. John district, for a resumé of her duties. Miss Martineau, who graduated in June 1927 from the School of Public Health Nursing of the University of Montreal, was sent last autumn by the Provincial Health Department to study the county health work in Ohio. Miss Martineau writes as follows of her present duties:

"On Monday the medical director draws up a programme for the week's work, and we set off with our luggage, consisting of scales and literature, to distribute to the mothers and children who attend our conferences. The work is very interesting and the field of action wide indeed. I firmly believe that a public health nurse can do a great deal of good in these communities. After arriving in a village we call on the curé and the local physicians, then we begin our work, which means school inspection, visits in the homes to babies, expect-

ant mothers and tuberculosis cases. We also hold conferences on maternal care and the hygiene of infancy. We exclude from the schools all non-vaccinated children and those with contagious diseases, as well as pediculosis. Talks on health topics are given in each class, and literature distributed as well as notices to the parents calling attention to the defects found. Home visits are made if necessary. We also have travelling anti-tuberculosis clinics; one is held each month in different places. After the examination of the patients, copies of the findings are sent to the family physician. The date of the clinic is announced by the curé at mass. The clinic, which lasts for two days, is largely attended. Patients diagnosed as positive and the suspected cases are visited at home. When any contagious disease is found an inquiry is made to ascertain the source. As a result of just one year of county unit work in this respect the contagious diseases have decreased greatly. Baby clinics have not yet been established in the villages, as it is so difficult for the mothers to come the long distances from the farms, especially in winter. But we have a series of letters for expectant mothers which we mail to all mothers sending in their names. These letters seem to be greatly appreciated, as during February 150 were mailed. We often receive letters from women who are far distant from a physician, asking advice for themselves or their children. Such advice is limited to questions pertinent to hygiene and the prevention of disease. The medical director does not make diagnosis or prescribe for individual diseases."

Work in a county health unit as described by Miss Martineau, a public health nurse, seems to offer every opportunity for improving rural health conditions. Let us hope that these units will be established in all the provinces and that doctors and nurses trained for public health work and having not only the public health point of view, but also the true missionary spirit, will be found to staff them.

Edith B. Hurley.

"The one great outstanding problem before the medical profession to-day is that involved in the delivery of adequate, scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life." *Olin West, M.D.*

LABORATORY SECTION

G. B. Reed, PhD., and C. M. Anderson, M.D.C.M., C.P.H.

Typhoid Vaccination by Mouth

THE work of several investigators indicates that certain bacteria introduced into the intestinal tract have antigenic action. Evidence of the antigenic action consists of positive agglutinin tests and increased resistance to infection. Evidence was obtained from both animal and human subjects.

The experiments described in this paper were designed to determine whether typhoid proteins were absorbed unaltered from the digestive tract as determined by the appearance of agglutinins; whether the agglutination titer would vary with the method of preparing the vaccine; whether "per os" vaccination is as effective as the subcutaneous method in stimulating the production of typhoid agglutinins; and to test the theory of increased cellular impermeability of the intestinal mucosa following the oral administration of typhoid vaccine.

The experiments were conducted on rabbits, the conclusions reached being as follows:

Agglutinins appear in the blood of some rabbits following introduction of standard typhoid vaccine by mouth. Artificial erosion of the intestinal mucosa in such rabbits is unnecessary.

Subcutaneous vaccination is more effective than vaccination by mouth in stimulating the production of typhoid agglutinins in rabbits.

The comparative degree of immunity to typhoid conferred by the two methods of vaccination remains to be determined. The comparative rate at which immunity develops, considered separately from the appearance of agglutinins, is also unknown. Since subcutaneous vaccination affords adequate protection against typhoid, any superiority of the oral method, considered from the practical standpoint, is limited to simplicity of administration and reduction in toxicity.

The absorption of typhoid protein from the intestinal tract of rabbits apparently decreases upon continued exposure of the mucosa to the protein.

(*Burke, V., & Barnes La, V. J. Inf. Dis.*, 39: 67, 1926. *Abs., J. Lab. & Cl. Med.*, 13: 502, 1928.)

The Role of the Dark-field in the Diagnosis of Syphilis, with Report of 255 Positive Cases

The author concludes that every initial lesion does not present the appearance of a typical Hunterian chancre and that the dark-field will bring to light many cases of syphilis that otherwise would be overlooked until too late; that extragenital lesions, whether primary or secondary, are exceedingly contagious and that the saving of a few hours, or even a few minutes, in establishing the contagious character of a lesion on the hand or about the mouth may prevent

most disastrous or even tragic results; that urethral chancres are far more common than generally believed and that every case of urethral discharge should be regarded as a possible symptom of beginning syphilis, even if the diagnosis of gonorrhea is positively established; that in view of the fact that the disease seems to have been eradicated in 94 per cent. of our cases whose Wassermann tests were negative while the dark-field was positive, a heavy responsibility rests upon all institutions and physicians who expect to diagnose and treat syphilis and diseases of the skin to see to it that a dark-field examination is made of every suspicious lesion as a routine procedure and also that where possible these examinations be made by a competent and experienced microscopist.

(*Thornley, Vero & Halpern, N.Y. State Jour. Med.*, 27: 1194, 1927. *Abs., Am. J. Syph.*, 12: 144, 1928.)

An Unusual Case of Typhoid Fever

A case clinically typhoid, and proved to be so at autopsy, in which positive agglutination tests could not be obtained during the disease. An agglutinable typhoid bacillus was obtained at autopsy.

(*Ross, K.C. Med. J. Australia*, 21: 580, 1926. *Abs., J. Lab. & Cl. Med.*, 13: 4, 1928.)

NATIONAL VOLUNTARY HEALTH AGENCIES

Jean E. Browne, Reg.N

Tuberculosis Study Among the Indians

THIS important field work was originated by a committee of the Canadian Tuberculosis Association. The Association interested the Deputy Superintendent-General of Indian Affairs and his Minister, the Hon. Mr. Stewart, whose department has financed the work. The committee is composed of Drs. Pagé, Carmichael, FitzGerald, Hill and Wodehouse. Two years' work has been carried out in British Columbia and reports have been completed under the direction of Dr. H. W. Hill. In reference to this work the report says in part:—"On investigation (coast bands in 1926, interior bands in 1927) there were studied and examined in seven Indian agencies (Kwawkewith, Bella Coola, Nass, Babine, Stuart Lake, Kamloops and Okanagan) a total of 1,871 Indians in 39 communities. About two-thirds (1,248) of the Indians seen were physically examined for tuberculosis, and all but 157 of this number were examined by X-ray. Epidemiological studies were made of the entire number, and examinations were made for the presence of goitre and trachoma. Goitre is present only

where salt water salmon is lacking in the diet. Trachoma was not detected in acute form and was not a factor in the Indians examined.'"

Canadian Tuberculosis Association.

The St. John Ambulance Brigade Overseas within the Dominion Canada

The common act of Ambulance and Nursing Divisions is defined as follows:—

The primary and distinctive duty of all members of the Brigade Overseas is the rendering of first aid, and in this respect the Ambulance and Nursing Corps and Divisions are on exactly the same footing. Except as regards stretcher drill, which women are not expected to perform, the duties of ambulance sisters, as members of the Brigade, are practically the same as ambulance men.

As it is necessary to be prepared to tend first aid cases which cannot be removed at once to the hospital or to their homes, and in view of the possible employment of members of both sexes as sick attendants in case of war or other emergency, every male member is to be encouraged to obtain the nursing certificate of the St. John Ambulance Association and to engage in such sick nursing, under medical direction, as he or she may be able to undertake.

It being impracticable to regulate nursing in the homes of the sick poor, under Brigade supervision, it is to be distinctly understood that any such work undertaken by members of the Brigade is to be considered as done on the individual responsibility of such members.

The advantages of belonging to such an organization as the St. John Ambulance Brigade Overseas are, briefly stated, as follows:—

(1) It ensures efficiency in first aid, as each member must re-qualify in that subject, and in the case of women, in nursing also, in each year of membership.

(2) It leads members to submit voluntarily to discipline. That this has far-reaching effect for good upon men is shown by the way in which large employers of labour encourage their employees to join the Brigade and to continue in it.

(3) It assures to members the acquisition of a certain amount of drill which enables them to act and move with precision, thus avoiding unseemly haste and display in cases of emergency. This gives the public confidence and often allays or prevents panic.

(4) It entitles members to wear a distinctive uniform when on public duty, so that they are readily distinguishable when their services are required.

(5) It enables trained men and women to place themselves at the disposal of naval, military and air force authorities in cases of national emergency, as was done in the recent war to the number of about one thousand members on active service, and three thousand in the military hospitals of Canada, and the hospitals of the Department of Soldiers' Civil Re-establishment.

Red Cross Nursing Outposts

The Canadian Red Cross Society helps to meet the need for nursing and hospital service in pioneer and frontier districts in Canada by the establishment and operation of small hospitals and nursing stations. From a modest beginning eight years ago, the work has grown until there are now 41 outposts in operation, mostly in the prairie provinces and in northern Ontario.

The type of outpost selected for any community depends, of course, on the peculiar needs of the community and the resources available. There are, however, three types of outpost:

(1) The centre for field nursing. The nurse works in the homes and schools of the district, but no provision is made for in-patients.

(2) The rural outpost with accommodation for one or two bed-patients but with field nursing as the chief work of the nurse.

(3) The outpost in a village or small town which functions as a small hospital.

In each case a preliminary survey is made before an outpost is established and local co-operation is assured to the extent of the resources of the community.

The immense total of work accomplished in Red Cross outposts is seen in the fact that during the past eight years 51,447 patients have received treatment in or through Red Cross outposts.

Outpost work has grown beyond the state of experiment. Confidence has developed in the plan, and consequently the number of outposts has grown until at present the number of outposts which could with advantage be established, is limited only by the amount of money available for their establishment and upkeep.

Canadian Red Cross Society.

NEWS AND COMMENTS

P. A. T. Sneath, M.B., D.P.H.

Convalescent Serum in Poliomyelitis

THE prophylactic value of convalescent serum in poliomyelitis in a Swedish epidemic in 1925 is carefully dealt with in an article by Dr. H. Davide, chief of the laboratory section of the State Bacteriological Institute in Stockholm, in the January Bulletin of "Office International D'Hygiène Publique".

The convalescent blood was obtained ten days or more after the temperature had returned to normal, the serum withdrawn, a sample subjected to the Wasserman test and 0.5 per cent. carbolic acid added as a preservative, and the whole put out in 5 c.c. ampoules. The prophylactic injection of 5 c.c. was given intramuscularly into the buttocks; 157 persons were chosen under the age of

25 years from amongst the inhabitants of isolated villages where the disease was epidemic. Of the foregoing, 73 received a prophylactic injection of convalescent serum, and only one small boy, aged 4 years, developed an illness 40 hours after injection, which may or may not have been poliomyelitis. This illness, if poliomyelitis, lasted only 12 hours and was quite atypical. The injection may have been given during the incubation period, in which case the disease would appear to have been aborted. Of the remaining 84, who were uninoculated and served as controls, 14 developed poliomyelitis, although the majority were of an abortive type; some, however, showed paralytic sequelae.

Definite conclusions naturally are not drawn from this work, but it is considered sufficiently encouraging to be a basis for further investigation.

Eugenics

MR. C. J. Bond, C.M.G., F.R.C.S., in delivering the Galton Lecture before the Eugenics Society in February last, made a timely suggestion with reference to the taking of the next decennial census in 1931. He stated that the life of a nation is the expression of hereditarily transmitted racial qualities of mind and body, and is dependent for these qualities on the large middle section of society, on which group there seems to be an increasing demand for the support of the more prolific lowest social groups, including the mental defectives, habitual paupers and criminal classes. It was his contention that the national census should be concerned not only with numbers, but should also reveal the quality of the race. If such an investigation should show deterioration in the population, as is probable, it would necessitate the creation of a racial conscience along biological lines by education. By this means segregation during the reproductive period, or sterilization of the degenerate sections of society following proper enquiry, would receive the support it warrants.

The problem in this country is equally as important as in the British Isles, with the additional factor here that we are trying to absorb members of other races. It seems reasonable, therefore, that census statistics should take cognizance of mental and physical factors as well as the numerical. By means of such we could, with our relatively small population, take stock of our present problems, prevent the immigration of inferior races, and avoid a multitude of difficulties which will face us when we have accommodated a population approximating that of Great Britain.

Smallpox and Climate

SIR Leonard Rogers, C.I.E., M.D., F.R.C.P., F.R.S., has subjected the data on smallpox to comparison with climatic data in England and Wales from 1921 to 1927, in a similar manner to the enquiry he made on the same problem in India, as published by the Medical Research Council in 1926. In his interesting paper in the British Medical Journal of February 25th, he concludes that low ab-

solute humidity favours smallpox and that high absolute humidity checks the disease, the seasonal prevalence being closely related to the same factor.

In a noteworthy prefatory paragraph, it is stated that "in 1926 the country of Jenner showed the unenviable record of returning 90% of the smallpox of Europe, exclusive of Spain and Russia", and the paper ends with the warning that the mild type of smallpox now endemic in England and Wales, which has increased on an average of 160 per cent. on the previous year for each of the past four seasons, is a reliable measure of what is likely to happen when the fatal form reappears, as the writer infers it will.

The "ostrich policy", fostered in the name of Liberty, seems to pervade our race in many ways, and in nothing is it more manifest than in this very problem. The unholy leaven of opposition to the prevention of smallpox has done much to create the present state of affairs in England, and we witness the vapourings of similar opposition within our own Dominion. It is sincerely to be hoped that the importation of the African and Indian forms of smallpox are not necessary to awaken our people to what can truly be called their "birthright" —Vaccination.

Maritime Provinces

THE insurance companies of Canada are contributing to public health endeavour in New Brunswick and Prince Edward Island under the aegis of the Canadian Tuberculosis Association. Miss Madge McCort, Reg. N., a Canadian who has been with the Milbank Foundation at Cottaraugus County, New York, is to carry out field work on tuberculosis. Another Canadian, Dr. P. A. Creelman, is severing his connection with the Ohio county health area demonstration under the Rockefeller Foundation, and is to become the first full-time Medical Officer of Health in Prince Edward Island. This appointment is also made financially possible by assistance from the insurance companies and the proceeds from the sale of Christmas stamps by the Tuberculosis Association. The sale of Christmas seals, it may be noted, is responsible for the support of seven public health nurses in other areas throughout the Dominion.

Quebec

THE Sickness Census of the poorest section of Montreal, P.Q. (the parishes of St. Catherine and Sacred Heart) was obtained in December 1926 through the co-operation of the University of Montreal and the General Health League, in conjunction with the Metropolitan Life Insurance Company, the latter of which tabulated and recently published the data. This investigation covered a population of 18,955 people of French extraction.

It was found that two and one-half per cent. of the population (495) were so sick as to be incapacitated from work. Of these, 9.5 per cent. were in hospital, 24 per cent. in bed at home, and 66.5 per cent. were at home, but up and about. Of those

not in hospital (90.5 per cent. of the sick), 18 per cent. obtained medical attention from a dispensary or out-patient department of some hospital. Altogether, 76 per cent. of the sick had had the services of a physician, and 20 per cent. of these had the benefits of attendance by the visiting nurse service.

Each male person, of whom there were 9,169, had lost on an average of 8.9 days per year, and each female of a population of 9,787 had lost 10.1 days, the amount of time lost being greater in the older age groups in both sexes. Of the 495 sick, 48.3 per cent. had been disabled for a year or more, and 26 per cent. had been ill less than one month, only 7 per cent. having been disabled for less than a week.

Respiratory diseases and influenza, heart disease, cerebral haemorrhage, "rheumatism," tuberculosis and external violence were the chief disabling conditions.

Below the age of 15 years, scarlet fever, whooping cough, diphtheria, pneumonia and the other respiratory diseases were in greatest evidence. Between 15 and 35 years the most important diseases were influenza, tuberculosis, appendicitis, and anaemia, with, in females, conditions associated with pregnancy. From 35-54 years diseases of the digestive system and diabetes were the most important, with external violence and "degenerative diseases" of some significance. Finally from 55 years on, so-called "rheumatism," heart disease, kidney disease, external violence and respiratory diseases were of greatest import.

Considerable valuable information can be obtained from a survey of this nature carried out by the existing health agencies of any city and would be well worth the effort expended upon it. The report known as the "Sickness Census in Montreal" may be obtained from The Metropolitan Life Insurance Company, Ottawa.

Ontario

THE resignation of Professor J. J. R. Macleod, F.R.S., who occupies the chair in Physiology at the University of Toronto, has recently been announced from the President's Office. Canada in general, and the University of Toronto in particular, suffer a distinct handicap in the withdrawal of this distinguished physiologist. Professor Macleod is leaving Toronto to become Regius Professor of Physiology in the University of Aberdeen, of which he is an alumnus, and will be able to devote the larger part of his time to research. Scotland is notable in her contribution of famous men to the world, but she excels herself more particularly in that, contrary to Holy Writ, she recognizes her distinguished sons, who are not without honour amongst their own countrymen. We deplore our own loss, but we offer congratulations to Professor Macleod.

Miss Jean E. Browne, Reg. N., has been honoured by the Spanish Red Cross Society, which has conferred upon her a medal in respect of her distinguished work for the Junior Red Cross, of which she is the national director in Canada.

Dr. Oskar Klotz, Professor of Pathology at the University of Toronto, who as a member of the Yellow Fever Commission of the International Health Division of the Rockefeller Foundation,, spent some months in West Africa in 1926, is returning to Lagos, Nigeria, after May 1st next on leave of absence from Toronto to continue his investigations on Yellow Fever.

An unfortunate misconception appears to have arisen amongst the farmers of the Province, who are largely concerned with the overnight tourist camps. The Provincial Department of Health had intended to regulate these camps on a permit system with inspection for the protection, not only of the tourists, but of the inhabitants of the countryside and towns, from the hazards of communicable diseases, which are of considerable significance in these days of motor transport. It would appear, however, that our sanitary conscience is not yet sufficiently robust to permit this commendable effort. Strong representation from the proprietors of tourist camps has resulted in the postponement of the scheme. It is hoped, however, in the interim that the fallacy may be dispelled with the propagation of an educational programme by the Department amongst those concerned.

Manitoba

IT is to be noted that the Canadian Nurses' Association is to hold its biennial meeting this year in Winnipeg. The session is to be held at the Fort Garry Hotel, and extends from July 3rd to 7th inclusive. It is expected that the strategic position of the Provincial Capital between both coasts should make for a large and successful meeting.

Saskatchewan

AT the last session of the Legislature, Saskatchewan adopted the Federal old-age pension scheme which is to be administered by the Department of Labour. It is reported following on a recent conference of the Provincial Minister of Agriculture and the Federal Minister of Labour for the purpose of arranging details that this Act will very soon become effective in the Province.

BOOK REVIEWS

D. T. FRASER, B.A., M.B., D.P.H. and R. R. MCCLENAHAN, B.A., M.B., D.P.H.

Infectious Diseases and Aseptic Nursing—By D. L. Richardson, M.D., Superintendent, Providence City Hospital, Providence, R.I. 182 pp. illustrated. Price $1.50. W. B. Saunders Co., London and Philadelphia. Canadian Agents: Messrs. McAinsh & Co., Ltd., Toronto.

Although this book contains less than 200 pages it deals with its subjects in a satisfying manner. It combines brevity without exclusion of essentials and it is easy to read. It pleases the reader in being brief with matters of unimportance, and in its longer chapters handles its more important subjects with much clarity.

It is a good book for the nurse, because it handles the subject of infectious disease in a common sense and simple way, and it should be an excellent guide for those entrusted with the teaching of nurses. It is honest in evaluating methods of control and treatment. In the first and larger portion infectious diseases are handled in order, a chapter long or short being devoted to each disease. The last portion on aseptic nursing technique is practically an excellent example of "standing orders" for an infectious disease hospital.

The book is written by a man who knows infectious disease as seen at the bedside. In brief it gives a nurse unfamiliar with infectious disease a splendid, and above all a practical, perspective in her approach to the subject.

A. Murray Jeffery.

(1) Muscular Activity—A. V. Hill, F.R.S. Williams & Wilkins Co., 1926, pp. 115. Price $3.50.

(3) Exercise in Education and Medicine — R. Tait McKenzie. W. B. Saunders Co., 1924, pp. 600. Price $5.50.

One of the most interesting aspects of preventive medicine of the near future, will no doubt have to do with the amount and type of exercise people of various types should be allowed to undertake. The effect of diets, radiation and heliotherapy, serotherapy, and so on, upon man, whether sick or well, has and is being discussed in the widest manner in all our journals and books. One is not surprised to find physiologists and others interpreting the effects of muscular exercise in terms of one's ability to recover therefrom.

One of the most interesting and authoritative books upon the subject is that entitled *"Muscular Activity"* by A. V. Hill. This book of 115 pages represents the substance of the 16th course of Herter Foundation lectures given annually at Johns Hopkins University. Dr. Hill has divided his work into four phases—the mechanical, thermal and chemical aspects of muscular activity and finally the application to man of the results obtained. Each of these, while of intense interest and of great value to the physiologist or research worker, is written in such a way as to make the results easily available for the general practitioner of medicine.

In chapter one is explained why a person adopts certain rates for all ordinary movements, why the size of a spade should be adjusted as much as the gears of bicycles to give a certain speed of movement when used by an ordinary man. If muscular movement be carried out too quickly or two slowly, the efficiency will be low. When using man in these experiments, Professor Hill chooses athletes because one can be sure that they, when trained, will work at their maximum until they have to stop, and one can be sure the reason they stop is due to oxygen-want and to the accumulation of lactic acid in their muscles. Many interesting facts have been illustrated. One of the most striking is his calculation of the heart's output, which at least under severe exercise must pump 17 gallons or more of blood each minute. It is little wonder indeed that the heart sometimes cannot withstand the strain. This little book should find a ready place in every medical library.

Another book, *"Exercise in Education and Medicine,"* deals with the subject from an entirely different angle. This book is now in its third edition and consists of 600 pages, divided into about thirty chapters, and is well illustrated, besides containing many tables and charts. It is written in a more or less popular manner and could be readily understood by the layman. The subjects described include all the types of exercises as taught in various schools, as well as massage, the treatment of scoliosis, abdominal weaknesses, obesity, visceroptosis, tic, stammering and chorea, infantile paralysis and so on. It is a book which will prove of the greatest value to all teachers of physical training and gymnasts. It would not be at all out of place, however, in any person's library and would form a means of ready reference to nearly any type of exercise.

D. T. Fraser.

BOOKS RECEIVED

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